#20/Declaration 8/6/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Timothy K. Carns, John L. Horvath, Lee J. DeBruler, and Michael J Westphal
Assignee:	Zilog, Inc.
Title:	PROCESS TO IMPROVE HIGH PERFORMANCE CAPACITOR PROPERTIES IN INTEGRATED MOS TECHNOLOGIES
Serial No.:	09/351,544
Filing Date:	July 12, 1999
Examiner:	Brock II, P.
Group Art Unit:	2815
Docket No.:	11599 M-10889 US
[Formerly:	ZILG.204[US0]

COMMISSIONER FOR PATENTS
Washington, D. C. 20231

DECLARATION OF TIMOTHY K. CARNS

Sir:

I, Timothy K. Carns, declare as follows, under the penalty of perjury:

1. I am the co-applicant with John L. Horvath, Lee J. DeBruler, and Michael J Westphal of the above-identified patent application and have been an employee of Zilog Corporation, a company specializing in production of microprocessors and the Assignee of the above-identified application. I hold B.S., M.S., and Ph.D. degrees in Electrical Engineering, all from University of California at Los Angeles, and have worked for Zilog from 1994 until the present and currently hold the position of Director, Process Integration, Technology Development.

2. The above-identified patent application relates to methods of fabricating capacitors in an integrated circuit. In the formation of integrated circuits at the 0.35μm scale and below, the use of anti-reflective layers for use in photolithographic processes has been introduced. These anti-reflective layers are formed over a structure to be etched and below the photoresist layer with which the etch will be performed. The anti-reflective layer is a highly absorbing film that substantially reduces standing waves as there is less reflection off the underlying structure and that also suppresses scattering from topological features of the underlying wafer. This greatly reduces variations in

Critical Dimension (CD, the minimum feature size of the layer being monitored) that can undermine the performance and reliability of the integrated circuit.

3. Among the other techniques used in the formation of integrated circuits is the use of metal silicides. Metal silicides are used to treat polysilicon layers in smaller devices with metal, thereby decreasing resistance of the polysilicon. A typical use is to apply a layer of a metal silicide to the control gates, or a layer that will become the control gates, of transistors in order to improve their conductivity. In the 0.35μm scale and below, polysilicon layers are commonly treated with such refractory (capable of enduring high temperatures) metal silicides. In subsequent processing stages, it will often be necessary to perform an etching process of the type described in the preceding paragraph. To again reduce the reflectivity of the layer to be etched, my coworkers and myself have found it necessary to place an anti-reflective layer under the photoresist and upon the layer to be etched, including any metal silicides as these have too high a reflectivity to sufficiently control variations in critical dimension (CD) and function as an anti-reflective layer.

4. In particular, the anti-reflective layer is generally designed to reduce the reflectivity of the radiation that penetrates the photoresist by an amount in the range of 70% to 85%. Such a level of absorption can provide the benefits in CD control described in the above referenced application, where an exemplary embodiment of an anti-reflective layer is a silicon rich oxinitride film (Si_xON_y).

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Executed this 29th day of July, 2002, at Nampa, Idaho.

Timothy K. Carns